WHAT IS CLAIMED IS:

1. A protein having a β1,3-galactosyltransferase activity derived from a microorganism having an activity of transferring galactose to *N*-acetylglucosamine with β1,3-linkage.

2. The protein according to claim 1, wherein the microorganism belongs to the genus *Streptococcus*.

3. The protein according to claim 2, wherein the microorganism is *Streptococcus agalactiae*.

4. A protein comprising the amino acid sequence represented by SEQ ID NO:1.

5. A protein comprising an amino acid sequence in which at most 20 amino acids are deleted, replaced, inserted or added in the amino acid sequence represented by SEQ ID NO:1, said protein having a β1,3-galactosyltransferase activity.

6. A DNA encoding the protein of any one of claims 1 to 5.

7. A DNA comprising the nucleotide sequence represented by SEQ ID NO:2.

8. A DNA which hybridizes with a DNA comprising the complementary sequence to the nucleotide sequence represented by SEQ ID NO:2 under stringent conditions, and encodes a protein having a β1,3-galactosyltransferase activity.

9. A recombinant DNA comprising the DNA of any one of claims 6 to 8 and a vector.

10. A transformant obtained by introducing the recombinant DNA of claim 9 into a host cell.

11. The transformant according to claim 10, wherein the host cell is a microorganism.

12. The transformant according to claim 11, wherein the microorganism belongs to the genus *Escherichia*.

13. The transformant according to claim 12, wherein the microorganism belonging to the genus *Escherichia* is *Escherichia coli*.

14. A method for producing a protein having a β1,3-galactosyltransferase activity, comprising:

culturing the transformant of any one of claims 10 to 13 in a medium to produce and accumulate a protein having a β1,3-galactosyltransferase activity in the culture, and

recovering the protein from the culture.

15. A method for producing a galactose-containing carbohydrate, comprising:

selecting, as an enzyme source, a culture of the transformant of any one of claims 10 to 13 or a treated product of the culture,

allowing the enzyme source, uridine-5'-diphosphogalactose and an acceptor carbohydrate to be present in an aqueous medium to produce and accumulate the galactose-containing carbohydrate in the aqueous medium, and

recovering the galactose-containing carbohydrate from the aqueous medium.

16. The method according to claim 15, wherein the treated product of the culture is selected from the group consisting of a concentrated product of the culture, a dried product of the culture, cells obtained by centrifuging the culture, a dried product of the cells, a

freeze-dried product of the cells, a surfactant-treated product of the cells, an ultrasonic-treated product of the cells, a mechanically disrupted product of the cells, a solvent-treated product of the cells, an enzyme-treated product of the cells, a protein fraction of the cells, an immobilized product of the cells and an enzyme preparation obtained by extracting from the cells.

17. The method according to claim 15, wherein the acceptor carbohydrate is a carbohydrate having *N*-acetylglucosamine at its non-reducing terminal.

18. The method according to claim 15, wherein the acceptor carbohydrate is selected from the group consisting of *N*-acetylglucosamine and lacto-*N*-triose II.

19. The method according to claim 15, wherein the galactose-containing carbohydrate is selected from the group consisting of lacto-*N*-biose and lacto-*N*-tetraose.